

REMARKS

This paper is being provided in response to the Office Action mailed February 27, 2007, for the above-referenced application. In this response, Applicants have cancelled claim 46 (claims 2-4, 15-23, 28-37 and 41-43 having been previously cancelled) without prejudice or disclaimer of the subject matter thereof, amended claims 1, 7, 8 and 38 and added new claims 47-64 to clarify that which Applicants consider to be the claimed invention. Applicants respectfully submit that the amendments to the claims and the new claims are fully supported by the originally-filed specification. (See, for example, Fig. 8, page 11, lines 25-31 and page 15, line 21 to page 16, line 2 of the originally-filed specification.)

Applicants submit that an Information Disclosure Statement was filed by Applicants on May 18, 2006 and received by the USPTO on May 22, 2006, according to PAIR records, which cited the reference WO 99/14785 identified on a substitute-form PTO 1449 with which a copy of the reference was provided. The form and reference are also indicated as having been received by the USPTO according to PAIR records. Applicants have not received a copy of the substitute-form PTO 1449 initialed by the Examiner to indicate consideration of this reference. Accordingly, Applicants respectfully request that a copy of the submitted substitute-form PTO 1449 be initialed by the Examiner and returned to Applicants in the next communication from the USPTO.

The rejection of claims 38-40 and 44-46 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,466,940 to Litman, et al. (hereinafter "Litman") is hereby traversed and

reconsideration is respectfully requested in view of the amendments to the claims contained herein. Claim 46 has been cancelled herein.

Independent claim 38, as amended herein, recites a method of detecting electrons. An electron beam is generated. The electron beam is focused on an object. Electrons scattered on the object or emitted by the object are detected using at least one detector positioned along an optical axis. A portion of the electrons is selected according to electron energy, wherein the selecting includes using a diaphragm, the diaphragm including at least one opposing field grid, and wherein said selecting includes applying a voltage to the opposing field grid such that the electrons emitted by the object are not detected. Claims 39, 40, 44 and 45 depend from independent claim 38.

The Litman reference discloses an electron detector with high backscattered electron acceptance for particle beam apparatus. The Office Action cites electron multiplier 106 as a detector and electrode 110 as an opposing field grid. At col. 4, lines 54-67, Litman discloses biasing the electrode 110 with a negative potential of sufficient magnitude to act as an energy filter for retarding secondary electrons emitted by the specimen.

Applicants' independent claim 38, as amended herein, recites a method of detecting electrons in which a portion of the electrons scattered or emitted from an object are selected according to electron energy, wherein the selecting includes using a diaphragm, *the diaphragm including at least one opposing field grid*, and wherein said selecting includes applying a voltage to the opposing field grid such that the electrons emitted by the object are not detected. The

Office Action cites the electrode 110 as an opposing field grid; however, Applicants submit that Litman does not disclose that electrode 110 is an opposing field grid and, thus, does not disclose using an opposing field grid in selecting a portion or electrons that includes applying a voltage to the opposing field grid such that the electrons emitted by the object are not detected. In view of the above, Applicants respectfully request that the rejections be reconsidered and withdrawn.

The rejection of claims 1, 5-13, 26 and 27 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,412,209 to Otaka et al. (hereinafter "Otaka") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

Independent claim 1, as amended herein, recites an electron-beam device having an optical axis including a beam generator that generates an electron beam. An objective lens focuses the electron beam on an object. At least one detector positioned along the optical axis detects at least one of: electrons scattered on the object and electrons emitted by the object. At least one opposing field grid is allocated to the at least one detector, wherein a voltage is applied to the opposing field grid such that the electrons emitted by the object are not detected by said at least one detector. Claims 5-14 and 24-27 depend directly or indirectly from independent claim 1.

The Otaka reference discloses an electron beam apparatus including an electron beam source, a unit for irradiating an electron beam on a specimen, a detector for secondary electrons, an electrode for generating an electric field sufficient to draw out secondary electrons in a recess

in the specimen from the recess, and a unit for generating a magnetic field for focusing secondary electrons drawn out of the recess.

Applicants' independent claim 1, as amended herein, recites an electron beam device includes at least the features of at least one detector positioned along the optical axis and detecting at least one of: electrons scattered on the object and electrons emitted by the object; and at least one opposing field grid which is allocated to the at least one detector, wherein a voltage is applied to the opposing field grid such that the electrons emitted by the object are not detected by said at least one detector. Applicants point out that the detectors disclosed by Otaka (see, for example, detector 106 in Figs. 5 and 7 and detector 201 in Figs 8-11 of Otaka) are not positioned along the optical axis to detect electrons as recited by Applicants. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

The rejection of claims 14 and 24-25 under 35 U.S.C. 103(a) as being unpatentable over Otaka in view of U.S. Patent No. 4,812,651 to Feuerbaum et al. (hereinafter "Feuerbaum") and U.S. Patent No. 5,408,098 to Wells (hereinafter "Wells") is hereby traversed and reconsideration is respectfully requested in view of the amendments to the claims contained herein.

The features of independent claim 1 are discussed above with respect to Otaka. Claims 14 and 24-25 depend therefrom.

The Feuerbaum reference discloses a spectrometer objective for a particle beam measuring instrument. Feuerbaum discloses an electrode arrangement decelerating secondary

electrons generated on the specimen. (See, for example, col. 3, line 66 - col. 4, line 5 of Feuerbaum).

The Wells reference discloses a method and apparatus for detecting low loss electrons in a scanning electron microscope. Applicants note, for example in Fig. 9 of Wells, that Wells discloses a primary electron column 10 that emits an beam 12 and a specimen 20 disposed in the beam 12 at a predetermined angle to provide a backscattered electron beam 22 subtending a large solid angle, a detector system 30' disposed to intersect the beam 22 and a detector 38' positioned at a nearly perpendicular orientation to the axis of the beam 12.

Applicants respectfully submit that neither Feuerbaum nor Wells overcome the above-noted deficiencies of the Otaka reference with respect to the presently claimed invention. Applicants submit that neither Otaka, Feuerbaum nor Wells, taken alone or in any combination, teach or fairly suggest an electron beam device including at least the features of at least one detector positioned along the optical axis and detecting at least one of: electrons scattered on the object and electrons emitted by the object; and at least one opposing field grid which is allocated to the at least one detector, wherein a voltage is applied to the opposing field grid such that the electrons emitted by the object are not detected by said at least one detector. Specifically, it is noted that Feuerbaum teaches the use of secondary electrons emitted from the specimen for analysis. However, Feuerbaum does not disclose that a detector is positioned along the optical axis and at least one opposing field grid is allocated to the detector wherein a voltage is applied to the opposing field grid such that the electrons emitted by the object are not detected by said at least one detector. Further, Wells does not disclose detectors positioned along an optical axis,

but rather discloses detectors positioned at a nearly perpendicular orientation to an generated electron beam to detect backscattered electrons from an angled specimen. Accordingly, Applicants respectfully request that the rejection be reconsidered and withdrawn.

Additionally, Applicants have added new claims 47-64. Applicants respectfully submit that these claims are patentable over the cited prior art of record. These claims recited a device and method that includes a first detector and a second detector, the first detector and the second detector detecting at least one of: electrons scattered on the object and electrons emitted by the object, said first detector being positioned object-side along the optical axis, and said second detector being positioned generator-side along the optical axis. Applicants direct attention, for example, to Fig. 8, detectors 19 and 21 and opposing field grid 36 and specifically, page 11, lines 25-31, page 12, lines 10-20 and page 15, lines 21-29 of the originally-filed specification.

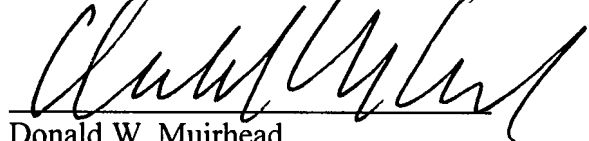
Applicants submit that the above-noted features are not disclosed by the cited prior art. Specifically, Otaka does not disclose two detectors being positioned along the optical axis at different positions (object-side and generator-side) of the electron beam device. Moreover, Otaka does not disclose the opposing field grid to be allocated to the second detector being positioned on the generator side. Instead, Otaka discloses that the grid 7a draws out secondary electrons towards a detector (see col. 5, lines 59-61 of Otaka). With a second electrode 8, secondary electrons of lower energy are filtered out (see col. 8, lines 33-36 of Otaka). The secondary electrons filtered out cannot be detected anymore. However, the presently-claimed invention teaches the use of two detectors and the allocation of the opposing field grid as

mentioned above to facilitate detecting electrons of low energy as well as electrons of high energy with different detectors.

The other references to Litman, Wells and Feuerbaum all do not disclose two detectors that are positioned object-side and generator-side along the optical axis and operate as claimed by Applicants. Applicants submits that the multiple detectors recited by Applicants do not recite mere "duplication" of one another, but rather each detector is recited with a specific operation and structural configuration with respect to one another and to the opposing field grid along an optical axis. Accordingly, Applicants respectfully submit that the above-noted claims are patentable over the cited prior art.

Based on the above, Applicants respectfully request that the Examiner reconsider and withdraw all outstanding rejections and objections. Favorable consideration and allowance are earnestly solicited. Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,
MUIRHEAD AND SATURNELLI, LLC



Donald W. Muirhead
Registration No. 33,978

Date: August 24, 2007

Customer No.: 26339
Muirhead and Saturnelli, LLC
200 Friberg Parkway, Suite 1001
Westborough, MA 01581
Phone: (508) 898-8601
Fax: (508) 898-8602